

HAYNES
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HAYNES® and HASTELLOY® High Performance Alloys

HAYNES
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High Temperature Alloys Nickel-Base

Alloy	Composition, Weight %										C	B	Cu	Others
	Ni ^a	Co	Fe	Cr	Mo	W	Mn	Si	Al	Ti				
B	67	2.5*	5	1*	28	-	1*	1*	-	-	0.05*	-	0.5*	V-0.3
S	67	2*	3*	16	15	1*	0.5	0.4	0.25	-	0.02*	0.015*	-	La-0.02
W	63	2.5*	6	5	24	-	1*	1*	-	-	0.12*	-	-	V-0.6*
X	47	1.5	18	22	9	0.6	1*	1*	-	-	0.10	0.008*	-	-
Waspaloy	58	13.5	2*	19	4.3	-	0.1*	0.15*	1.5	3	0.08	0.006	0.1*	Zr-0.05
R-41	52	11	5*	19	10	-	0.1*	0.5*	1.5	3.1	0.09	0.006	-	-
75	76	-	5*	20	-	-	1*	1*	-	0.4	0.11	-	0.5*	-
HR-160®	37	29	2*	28	1*	1*	0.5	2.75	-	0.5	0.05	-	-	-
214™	75	-	3	16	-	-	0.5*	0.2*	4.5	-	0.05	0.01*	-	Zr-0.1*, Y-0.01
230®	57	5*	3*	22	2	14	0.5	0.4	0.3	-	0.10	0.015*	-	La-0.02
242™	65	1*	2*	8	25	-	0.8*	0.8*	0.5*	-	0.03*	0.006*	0.5*	-
263	52	20	0.7*	20	6	-	0.6*	0.4*	0.6*	2.4*	0.06	-	0.2*	-
617	54	12.5	1	22	9	-	-	-	1.2	0.3	0.07	-	-	-
625	62	1*	5*	21	9	-	0.5*	0.5*	0.4*	0.4*	0.10*	-	-	Cb+Ta-3.7
625SQ®	62	1*	5*	21	9	-	0.5*	0.15*	0.4*	0.4*	0.03*	-	-	Cb+Ta-3.7, N-0.02*
718	52	1*	19	18	3	-	0.35*	0.35*	0.5	0.9	0.05	0.004	0.1*	Cb+Ta-5.0
X-750	70 ^b	1*	8	16	-	-	0.35*	0.35*	0.8	2.5	0.08*	-	0.5*	Cb+Ta-1.0

*Maximum

^aAs balance

^bMinimum

H-1031K

EXHIBIT

K

High Temperature Alloys Cobalt-Base

Alloy	Co ^a	Ni	Fe	Cr	Mo	W	Mn	Si	C	Others
6B	58	2 5	3*	30	1 5*	4	1 4	0 7	1	-
25	51	10	3*	20	-	15	1 5	0 4*	0 10	-
188	39	22	3*	22	-	14	1.25*	0.35	0.10	La-0.03

High Temperature Alloys Iron-Base

Alloy	Fe ^a	Ni	Co	Cr	Mo	W	Mn	Si	Al	N	C	Others
MULTIMET [®]	30	20	20	21	3	2 5	1 5	1*	-	0 15	0 12	Cb + Ta-1 0
556 TM	31	20	18	22	3	2.5	1	0 4	0 2	0 20	0 10	Ta-0 6, Zr-0 02, La-0 02
HR-120 [®]	33	37	3*	25	2 5*	2 5*	0 7	0 6	0 1	0 20	0 05	Cb-0 7, B-0 004

Titanium Alloys

Alloy	Ti ^a	Al	V	Fe	Sn	Cr	C	N	O	H
Ti-3Al-2.5V	94	3	2 5	0 25*	-	-	0 05*	0 02*	0 12*	**

Corrosion-Resistant Alloys Nickel-Base

Alloy	Ni ^a	Co	Fe	Cr	Mo	W	Mn	Si	C	Cu	Others
B-2	69	1*	2*	1*	28	-	1*	0 1*	0 01*	-	-
B-3 [®]	65 ^b	3*	1 5	1.5	28 5	3*	3*	0 1*	0 01*	-	Al-0 5*; Ti-0 2*
C-4	65	2*	3*	16	16	-	1*	0 08*	0 01*	-	Ti-0 7*
C-2000 [®]	59	2*	3*	23	16	-	-	0 08*	0 01*	1 6	-
C-22 [®]	56	2 5*	3	22	13	3	0 5*	0 08*	0 01*	-	V-0 35*
C-276	57	2 5*	5	16	16	4	1*	0 08*	0 01*	-	V-0 35*
D-205 TM	65	-	6	20	2 5	-	-	5	0 03*	2	-
G-30 [®]	43	5*	15	30	5 5	2 5	1 5*	0 8*	0 03*	2	Cb-0 8
G-35 TM	58	1*	2*	33 2	8 1	-	0 5*	0 6*	0 05*	0 3*	-
G-50 [®]	50	2 5*	17 5	20	9	1*	1*	1*	0 02*	0 50*	Al-0 4; Cb-0 5
N	71	0 2*	5*	7	16	0 5*	0 8*	1*	0 08*	0 35*	Al+Ti-0 5*

Corrosion-Resistant Alloys Cobalt-Base

Alloy	Co ^a	Ni	Fe	Cr	Mo	W	Mn	Si	C	N
ULTIMET [®]	54	9	3	26	5	2	0 8	0 3	0 06	0 08

*Maximum

**Varies with specifications

^aAs balance^bMinimum